What is claimed is:

1. A method of reducing spent oxide nuclear fuel to nuclear-fuel metal, in which metal oxides are reduced to metals using an electrochemical reduction device with LiCl-based salt as an electrolyte, wherein LiCl-Li_2O salt is used as the LiCl-based salt.

2. The method as set forth in claim 1, wherein the spent oxide nuclear fuel is reduced at the temperature of 600 to 700℃ and the potential of -2.592 V or higher.

3. The method as set forth in claim 1, wherein the spent oxide nuclear fuel is reduced at the temperature of 600 to 700□ and the potential of -2.592 V or lower.

4. A cathode electrode assembly for reducing the spent oxide nuclear fuel to the nuclear-fuel metal, comprising:

a spent oxide nuclear fuel injection part;

an outer pipe connected to the spent oxide nuclear fuel injection part at the upper part thereof;

a porous magnesia filter connected to the lower part of the outer pipe;

a solid electrode extended from the top of the outer

pipe to the inside of the magnesia filter and having radial blades positioned at the lower part thereof; and

an alumina tube surrounding the solid electrode except the radial blades positioned at the lower part of the solid electrode.

5. The cathode electrode assembly as set forth in claim 4, wherein the porous magnesia filter has pores with an average diameter of 5 to 10 ㎛.

6. The cathode electrode assembly as set forth in claim 4, wherein the porous magnesia filter is made of magnesium oxide.

7. A reduction device for reducing spent oxide nuclear fuel to nuclear-fuel metal, comprising:

the cathode electrode assembly as claimed in claim 4;

a plurality of anodes located on circle around the cathode electrode assembly while being spaced apart from each other at predetermined regular intervals;

a reference electrode located on the same circle as the anodes and positioned at the middle of two adjacent anodes;

an electrolyte injection part for injecting an

electrolyte into the reduction device;

a $LiCl-Li_2O$ salt injected through the electrolyte injection part into the reduction device; and

a reactor receiving the cathode electrode assembly, the anodes, the reference electrode, and the $LiCl-Li_2O$ molten salt.

8. The reduction device as set forth in claim 7, wherein the removable cathode electrode assembly is installed in the reduction device.

9. The reduction device as set forth in claim 7, wherein each of the anodes is ceramic oxide selected from the group consisting of Fe3O4, SnO, and NiO.

10. The reduction device as set forth in claim 7, wherein the reactor has a dual structure comprising an inner reaction vessel and an outer reaction vessel, and an alumina crucible is inserted between the inner reaction vessel and outer reaction vessel.